

WE CLAIM AS OUR INVENTION:

1. An x-ray tube comprising:
a stationary vacuum housing having a central axis;
an electron-emitting cathode and a ring electrode having an impact surface disposed in said vacuum housing;
a deflection system disposed in said vacuum housing for interacting with electrons emitted by said cathode to focus and deflect said electrons to form an electron beam which is incident on said impact surface to generate x-rays;
a round exit window for said x-rays disposed in a plane perpendicular to the central axis and terminating one side of said vacuum housing;
said impact surface of said ring anode being beveled and aligned to said exit window; and
an annular anode cooling arrangement surrounding said ring anode at an exterior of said vacuum housing.
2. An x-ray tube as claimed in claim 1 further comprising a diaphragm disposed at said exit window at said vacuum housing defining a circular opening for passage of said x-rays therethrough.
3. An x-ray tube as claimed in claim 1 wherein said vacuum housing comprises an isolator connected to a piston part, said piston part having an expanded portion in which said ring anode is disposed and having said side terminated by said exit window.
4. An x-ray tube as claimed in claim 1 wherein said deflection system is a quadruple magnet system.

5. An x-ray tube as claimed in claim 1 wherein impact surface of said ring anode has a cross-section primarily formed as a circular arc.

6. An x-ray tube as claimed in claim 5 wherein said impact surface has a center point disposed outside of said ring anode.

7. An x-ray tube as claimed in claim 1 wherein said ring anode has a primarily triangular cross-section with a long side and a short side, said short side being directed toward said exit window and said impact surface being disposed on said short side.

8. An x-ray system comprising:

an x-ray tube comprising a stationary vacuum housing having a central axis, an electron-emitting cathode and a ring electrode having an impact surface disposed in said vacuum housing, a deflection system disposed in said vacuum housing for interacting with electrons emitted by said cathode to focus and deflect said electrons to form an electron beam which is incident on said impact surface to generate x-rays, a round exit window for said x-rays disposed in a plane perpendicular to the central axis and terminating one side of said vacuum housing, said impact surface of said ring anode being beveled and aligned to said exit window, and an annular anode cooling arrangement surrounding said ring anode at an exterior of said vacuum housing;

a radiation detector matrix, said x-ray tube being oriented relative to said radiation detector matrix so that said x-rays exiting through said exit window are incident on said radiation detector matrix; and

a slit diaphragm disposed in a path of said x-rays between said x-ray tube and said radiation detector matrix.

9. An x-ray system comprising:

an x-ray tube comprising a stationary vacuum housing having a central axis, an electron-emitting cathode and a ring electrode having an impact surface disposed in said vacuum housing, a deflection system disposed in said vacuum housing for interacting with electrons emitted by said cathode to focus and deflect said electrons to form an electron beam which is incident on said impact surface to generate x-rays, a round exit window for said x-rays disposed in a plane perpendicular to the central axis and terminating one side of said vacuum housing, said impact surface of said ring anode being beveled and aligned to said exit window, and an annular anode cooling arrangement surrounding said ring anode at an exterior of said vacuum housing;

a radiation detector, said x-ray tube being oriented relative to said radiation detector so that x-rays exiting through said exit window are incident on said radiation detector; and

a depth diaphragm disposed in a path of said x-rays between said x-ray tube and said radiation detector matrix, said depth diaphragm having a plurality of slits, and wherein said deflection system in said x-ray tube deflects said electron beam relative to said impact surface to produce a plurality of beam fans, said depth diaphragm having a plurality of slits through which said beam fans respectively pass, and strike respective detector lines of said radiation detector.